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Memorandum

To: **LaDonna Turner, Site Assessment Manager**
Technical and Enforcement Branch
U.S. Environmental Protection Agency, Region 6

From: **Dana Bahar, Manager, Superfund Oversight Section,**
Ground Water Quality Bureau, New Mexico Environment Department

Date: **March 31, 2011**

Subject: **Pre-CERCLIS Screening Assessment of Section 13 Mine, New Mexico:**
Further Action Under CERLCA Recommended

Site name	Section 13 Mine	**Street address**	NA		
City	NA	**State**	New Mexico	**Zip code**	NA
County	McKinley County				
Latitude	35°26'27.46"	**Longitude**	107°50'47.50"		

Site physical description:
The Section 13 mine (Site) is located approximately 7 miles northwest of the junction of State highways 509 and 605 (Figure 1). The Site was reclaimed in 1991 and 1992 under the Prior Reclamation Criteria of the New Mexico Mining Act Rules (19.10.5.511 NMAC). Physically all that remains on site is the recontoured and capped waste rock piles and adjoining filled area that capped the shaft and remaining concrete slabs. The mounded area approximately 7 acres in size with side slopes ranging from 10:1 and 5:1 (Ref. 1). The New Mexico Energy Minerals and Natural Resources Department (NMEMNRD) released Homestake Mining Company of California in 1995 from further requirements of the New Mexico Mining Act (Ref. 2).

Site identification:
The Site is one of approximately 97 legacy uranium mines identified in the Ambrosia Lake mining district of the Grants Mineral Belt (Ref. 2).

Site summary:
A vertical shaft was sunk to a depth of 681 feet below the surface. The Site was an underground mine which used a modified room and pillar method to recover the primary and redistributed ore. The Site was in operation from 1977 to 1981 when mining activities ceased (Ref. 1).

The stratographic units underlying the site include the Cretaceous system of Mancos shale and Dakota sandstone overlying the Jurassic System of the Morrison Formation. Uranium ore is found in the sandstone units of the Westwater Canyon member of the Morrison Formation (Ref. 1). Production levels from the Site are not stated and listed as confidential in the NMEMNRD database but ranks the Site as the 20th highest in ore production for the Ambrosia mining district (Ref. 2).

The Site was considered a "dry" mine in that at the time of operation the ore deposits were above the water table so there was no need to dewater the mine workings by pumping ground water from the Site (Ref. 3). One reason this Site may have been considered a "dry" is that at the time of operation (1977) in that other underground mines in the Ambrosia Lake Mining District had been dewatering mine workings for many years prior to the Site's operation which lowered the water table below the ore zone in the vicinity of the Site (Ref. 4). It is unknown if ground water is repressurizing the ore zone now that ground water pumping of mine workings has ceased.

The Site was considered an "Existing Mining Operation" and was reclaimed by Homestake Mining Company of California under the Prior Reclamation Criteria of the New Mexico Mining Act and the New Mexico Mining Rules and Regulations. Structures that existed during the operational period included an access road, vertical shaft, ventilation borehole, hoist house, storage and adminstration buildings. Reclamation was conducted 1991 and 1992, and the Site was afterwards grazed as required under the lease agreement with the State of New Mexico. Reclamation proceeded in 3 phases, and included removal of buildings, hoist, and headframe; sealing of the vertical shaft and borehole; and trash removal. The boreholes were backfilled to within 5 feet of the surface, with casings cut-off at 4 to 8 feet below the original ground surface. All but one borehole was topped with a 2-foot thick, reinforced concrete cap; one borehole had a steel plate welded to the top of the casing. The vertical shaft was backfilled to within 2 feet of the surface and capped with a reinforced concrete cap. Waste piles were reshaped, covered with soil, and contoured for natural drainage. The soil used to fill the main shaft, boreholes and cap waste piles from two cut areas on the Site. Finally 20 acres were reseeded using a drill seeder and mulch (Ref. 1). NMEMNRD released Homestake Mining Company of California in 1995 from further requirements of the New Mexico Mining Act. No ground water investigation was conducted as part of the reclamation activities nor did the Site operate or close under a NMED Ground Water Discharge Plan.

Targets:
Wells that are registered with the New Mexico Office of the State Engineer (OSE) and located within a 4-mile radius are shown in Table 1. There is a ranch with several residences just over a mile to the east of the Site. During NMEDs ground water investigation of San Mateo Creek a domestic well was sampled at this residence. This well does not appear on the OSE database (Ref. 5). The analytical results from the sampled well show ground water concentrations below the Environmental Protection Agency (EPA) Maximum Contaminant Levels (MCL) and the New Mexico Water Quality Control commissions (NMWQCC) ground water standards.

No assessment was conducted for surface and radioactivity hazards at the Site to determine if surface reclamation has been effective in the long-term elimination of such threats to human health and the environment. The Site has been released for grazing livestock.

Site ownership and Potential Responsible Parties:
The Site was in operation from 1977 to 1981. The Site was originally operated under the United Nuclear-Homestake Partners under a lease from the Santa Fe Pacific Railroad, owner of the mineral rights. In 1981 the partnership dissolved and the operator became Homestake Mining Company-Grants, later renamed Homestake Mining Company of California. The owner of the surface estate is Mr. Jerry Elkins (Ref. 1).

File review:
Files that were reviewed for this assessment are listed below.

Site reconnaissance:
The last documented Site Reconnaissance occurred in 1995 (Ref. 6). NMED has not conducted a site reconnaissance.

Recommendation:
The Site should be assessed for surface and radioactivity hazards to determine if surface reclamation has been effective in the long-term elimination of such threats to human health and the environment. Additionally, the capping of shafts and boreholes should be evaluated to determine their long-term

effectiveness toward preventing potential contaminant migration to ground water. NMED also recommends assessment of sediments in the Site vicinity in order to evaluate the potential occurrence of impacts from dispersal of waste materials that have been left on-Site.

This Site was considered a "dry" mine which could have been due to the dewatering of other mines in the Ambrosia Lake mining district that lowered the water table below the ore zone. The Site did not start operations until 1977, some 20 years after mining and mine dewatering commenced in Ambrosia Lake. The Site would not have discharged mine water thus would not have contributed directly to alluvial ground water impacts.

If in fact this Site is repressurizing, data from other former "wet" mines suggest that repressurization of the ore-host Morrison Formation, following cessation of pumping for mine dewatering, may be causing mobilization of uranium and associated minerals, and consequent degradation of ground water quality, due to influx of oxygenated ground water. The potential for such impacts, on both regional and site-specific scales, should also be assessed and characterized

References:

1. Homestake Mining Company of California, 1994, Reclamation Report Section 13 Mine, compiled by AK GeoConsult, Inc.
2. New Mexico Energy, Minerals and Natural Resources Department, 2007, Abandoned and inactive uranium mines in New Mexico database, Mining and Minerals Division.
3. New Mexico Energy, Minerals and Natural Resources Department, 2007, Abandoned and inactive uranium mines in New Mexico database, Mining and Minerals Division.
4. Brod, Robert C., 1979, Hydrogeology and Water Resources of the Ambrosia Lake-San mateo Area McKinley and Valencia Counties New Mexico, New Mexico Institute of Mining and Technology.
5. New Mexico Office of the State Engineer, 2011, New Mexico water rights reporting system database, point of diversion by location, four mile radius of Section 13 Mine.
6. New Mexico Energy Minerals and Natural Resources Department., Reclamation Inspection Report, Report Submitted to File for Section 13 Mine, Mining and Minerals Division, Mining Act Reclamation Program

Table 1. Wells within a Four Mile Radius for Section 13 Mine, Office of the State Engineer.

OSE File Number	Well Use	Well Owner	Section	Township	Range	Depth of Well (ft)	Depth of Water (ft)	Water Column (ft)
Wells (>1 and <2 miles)								
B 00366	Mining[a]	RIO ALGOM MINING LLC	24	14N	10W	760	*	*
B 00994	Mining[a]	RIO ALGOM MINING LLC	19	14N	09W	779	*	*
B 00372	Mining[a]	SABRE-PINON CORPORATION	23	14N	10W	796	*	*
B 00994	Mining[a]	RIO ALGOM MINING LLC	17	14N	09W	1094	*	*
B 00371	Mining[a]	SABRE-PINON CORPORATION	25	14N	10W	752	*	*
B 00364	Mining[a]	ANDERSON DEVELOPMENT CORP.	30	14N	09W	735	*	*
B 00994	Mining[a]	RIO ALGOM MINING LLC	30	14N	09W	810	*	*
B 00363	Mining[a]	RIO ALGOM MINING LLC	22	14N	10W	745	*	*
Wells (>2 and <3 miles)								
B 00373	Mining[a]	RIO ALGOM MINING LLC	22	14N	10W	1003	*	*
B 00994	Mining[a]	RIO ALGOM MINING LLC	22	14N	10W	827	*	*
B 00365	Mining[a]	ANDERSON DEVELOPMENT CORP.	20	14N	09W	793	*	*
B 00994	Mining[a]	RIO ALGOM MINING LLC	30	14N	09W	750	*	*
B 00362	Mining[a]	RIO ALGOM MINING LLC	22	14N	10W	3093	*	*
Wells (>3 and <4 miles)								
B 00143	Domestic	(b) (6)	35	15N	10W	90	60	30

* = Value Unknown

[a] = Well may be used as a domestic well

Figure 1. Section 13 Mine Location, Ambrosia Lake Mining District, McKinley County, New Mexico